ATTACHMENT E

Dust Mitigation Plan

Trapper Solar Project

Dust Mitigation Plan

MAY 2024; REVISED NOVEMBER 2024

PREPARED FOR

RWE Solar Development, LLC

PREPARED BY

SWCA Environmental Consultants

TRAPPER SOLAR PROJECT DUST MITIGATION PLAN

Prepared for

RWE Solar Development, LLC
701 Brazos Street, Suite 1400
Austin, Texas 78701

Prepared by

SWCA Environmental Consultants
295 Interlocken Boulevard, Suite 300
Broomfield, Colorado 80021
(303) 487-1183
www.swca.com

SWCA Project No. 72166.003

May 2024

EXECUTIVE SUMMARY

RWE Solar Development, LLC (RWE), is proposing to develop the Trapper Solar Project in Routt County, Colorado, which would consist of an up to 250-megawatt (MW), alternating current, utility-scale solar energy system; an up to 125-MW (4-MW/hour storage energy capacity) battery energy storage system (BESS); and ancillary facilities. The Project would sit on approximately 3,030 acres of private and state-owned land, approximately 1.5 miles south of the town of Hayden (Project area). Routt County requires preparation of a dust mitigation plan for the Project under Section 3.1.D.9.a of their land use code.

Construction of the Project is expected to take 18 months, in which the Project would create particulate matter (PM) emissions from off-road vehicle and equipment exhaust, construction worker and material delivery, on-road vehicle exhaust from travel to and from the Project area, and fugitive dust from soil disturbance and travel on paved and unpaved roads. Construction activities expected to generate fugitive dust will include land clearing, excavating, trenching, and grading. The amount of dust generated will be a function of construction activity, soil type, soil moisture content, wind speed, precipitation, vehicle traffic, vehicle types, and roadway characteristics. Emissions will be greater during dry periods and in areas of fine-textured soils subject to surface activity. The U.S. Environmental Protection Agency has set forth standards for air quality based on the measure of the concentration of micrograms of pollutants per cubic meter of air for PM emissions. Colorado requires a land development Air Pollution Emission Notice if a land development project is greater or equal to 25 contiguous acres and/or 6 months in duration.

Routt County requires a dust mitigation plan for all solar projects under Section 3.1.D.9.a of their land use code. This Dust Mitigation Plan quantifies the fugitive dust emissions associated with the construction and operation of the Project, quantifies the anticipated levels of fugitive dust created by the Project-related traffic, and identifies potential mitigation measures that can be used to minimize fugitive dust emissions.

This page intentionally left blank.

CONTENTS

Appendices

Tables

This page intentionally left blank.

1 INTRODUCTION

The Trapper Solar Project (Project) is proposed in Routt County, Colorado on approximately 3,030 acres of private and state-owned land (Project area). RWE Solar Development, LLC (RWE) retained SWCA Environmental Consultants (SWCA) to prepare a Dust Mitigation Plan in support of the Project to meet Section 3.1.D.9.a of Routt County's Unified Development Code Resolution 2023-P-083.

The objective of this Dust Mitigation Plan is to:

- Quantify the fugitive dust emissions associated with the construction and operation of the Project;
- Quantify the anticipated levels of fugitive dust created by the Project-related traffic; and
- Identify potential mitigation measures that can be used to minimize fugitive dust emissions.

1.1 Project Description

The Project is a proposed 250-megawatt (MW) alternating current utility-scale solar energy system, an up to 125-MW (4-MWhour storage energy capacity) battery energy storage system (BESS), and ancillary facilities in Routt County, south of Hayden, Colorado. The Project is within the Routt County Agriculture and Forestry zone district.

Construction of the Project is expected to take 18 months, in which the Project would create particulate matter (PM) emissions from off-road vehicle and equipment exhaust, construction worker and material delivery, on-road vehicle exhaust from travel to and from the Project area, and fugitive dust from soil disturbance and travel on paved and unpaved roads. Construction activities expected to generate fugitive dust will include land clearing, excavating, trenching, and grading. Upon completion of construction, temporary impacts will be remediated by restoration and reseeding of graded or cleared areas within the Project area.

1.2 Regulatory Background on Fugitive Dust

The U.S. Environmental Protection Agency (EPA) has set forth standards for air quality based on the measure of the concentration of micrograms of pollutants per cubic meter of air ($\mu g/m^3$) for PM emissions. PM is further classified as PM_{10} and $PM_{2.5}$. PM_{10} is defined as having a nominal aerodynamic diameter of 10 microns or less; and $PM_{2.5}$ is defined as having a nominal aerodynamic diameter of 2.5 microns or less. The EPA has established National Ambient Air Quality Standards (NAAQS) to protect human health and public welfare with both primary and secondary standards. Primary standards protect human health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards are designed to protect public welfare, including visibility, animals, crops, vegetation, and buildings. These standards reflect the latest scientific knowledge and have an adequate margin of safety intended to address uncertainties and provide a reasonable degree of protection (EPA 2024a). The NAAQS for PM_{10} and $PM_{2.5}$ are:

- PM_{10} (24-hour standards is 150 $\mu g/m^3$ and not to be exceeded one time per year over a three-year average); and
- $PM_{2.5}$ (annual average primary and secondary standards with levels of 9.0 $\mu g/m^3$ and 15.0 $\mu g/m^3$, respectively; the 24-hour standard is 35 $\mu g/m^3$ based on the 98th percentile average over three years) (EPA 2024a).

Colorado requires a land development Air Pollution Emission Notice (APEN) if a land development project is greater or equal to 25 contiguous acres and/or 6 months in duration, but if the land development is greater than 1,850 acres a Construction Permit is required. It is important to note that if a Construction Permit is required, the APEN becomes a part of the permit application (Colorado Department of Public Health and Environment 2024).

Additionally, Routt County, Colorado has set forth the requirement of a dust mitigation plan for all solar projects under section 3.1.D.9.a of their municipal code. In summary, the dust mitigation plan must be specific to the duration of the Project and at a minimum utilize the following mitigation measures:

- Limit area of disturbance to reduce dust generation;
- Minimize overlot grading for projects and phase grading with construction;
- Minimize dust through gravel, water, or chemically stabilizing public and private access roads, stripped areas, transfer points and excavations. Gravel or chemical stabilization is preferred, and water stabilization shall be minimized to the extent possible;
- Increase mitigation operations immediately in response to periods of high wind conditions or dust complaints; and
- Revegetate disturbed areas as soon as possible.

1.3 Existing Conditions

This section discusses the existing air quality conditions as they pertain to fugitive dust in the vicinity of the Project.

1.3.1 Attainment Status

EPA designates the attainment status of an area on a pollutant-specific basis based on whether an area meets the NAAQS. Areas that meet the NAAQS are termed “attainment areas.” Areas that do not meet the NAAQS are termed “nonattainment areas.” Areas for which insufficient data are available to determine attainment status are termed “unclassified areas.” Areas formerly designated as nonattainment areas that have subsequently reached attainment are termed “maintenance areas.”

According to the EPA Greenbook, a portion of Routt County is in maintenance for PM_{10}, but only for the city of Steamboat Springs (EPA 2024b). Because the Project is not within the Steamboat Springs city limits, the Project area is in attainment and therefore, not subject to the EPA’s General Conformity review (EP 2024c).

1.3.2 Background PM Concentrations

Routt County contains ambient air quality monitors that collect data concerning existing levels of various air pollutants. Summary data from the EPA AirData database (EPA 2024d) were reviewed in order to characterize maximum or near-maximum existing concentrations to identify background PM concentrations.

Ambient air quality monitoring data from the 3-year period from 2021 through 2023 for PM_{10} are summarized in Table 1. The second-highest short-term concentrations are listed, in accordance with EPA’s standard practice. Regional data for $PM_{2.5}$ was not readily available (EPA 2024d).

Table 1. Ambient PM_{10} Concentrations Representative of the Project Area

Pollutant	Averaging Period	Rank	2021	2022	2023	Unit	Monitoring Station ID
PM_{10}	24-Hour	2nd	69	45	60	µg/m³	081070003[a]

[a] 136 6th Street, Steamboat Springs, Colorado.

Source: EPA 2024b

To summarize existing PM emissions based on current land use, National Emission Inventory (NEI) data from the most recent dataset (EPA 2020) was reviewed for Routt County. Table 2 provides a breakdown of the top three PM_{10} emission sources compared to the total.

Table 2. PM_{10} NEI Data for Routt County, Colorado

Emission Source	Total (tons)
1. Fires (wildfires)	14,165.315
2. Dust (unpaved road dust)	1,547.996
3. Agriculture (crops and livestock dust)	1,002.765
All other mobile and nonpoint PM sources	337.234
Point source emissions	369.372
Total of all mobile, point, and nonpoint emissions in Routt County, Colorado	17,422.682

Source: 2020 Routt County NEI data (EPA 2020).

According to the EPA's NEI data, the most significant source of PM_{10} emission in Routt County comes from wildfires.

2 FUGITIVE DUST

This section discusses emissions associated with construction and operation of the Project as well as mitigation measures used to reduce and/or control dust.

2.1 Potential Dust Impacts from Construction and Operation

Construction activities for the Project will result in emissions of fugitive dust from vehicular traffic and soil disturbance, and combustion emissions from diesel and gasoline-fired construction equipment. Fugitive dust will result from earthmoving, construction activities, loading/unloading activities, material stockpiling, concrete work, and vehicle traffic on paved and unpaved roads. Additionally, fugitive dust from operation activities for the Project will result from trucks traveling for inspection and maintenance, testing, and day to day operations.

The amount of dust generated will be a function of construction activity, soil type, soil moisture content, wind speed, precipitation, vehicle traffic, vehicle types, and roadway characteristics. Emissions will be greater during dry periods and in areas of fine-textured soils subject to surface activity. SWCA calculated estimates of fugitive dust emissions associated with construction activities, worker commutes, and material deliveries (Table 3) and fugitive dust emissions (Table 4) associated with the operation of the Project.

Table 3. Project Fugitive Dust Emissions from Construction

Emission Source	PM_{10} (tons for 18 months of construction)	$PM_{2.5}$ (tons for 18 months of construction)
Construction activities (off-road and earthmoving activities)	77.20	8.85
Worker commutes	0.05	0.02
Material deliveries	20.66	2.36
Total	**97.91**	**11.23**

Appendix A. Detailed Fugitive Dust Calculation Workbook

Table 4. Project Fugitive Dust Emissions from Operation

Emission Source	PM_{10} (tons per year)	$PM_{2.5}$ (tons per year)
Operations	3.01	0.49

Appendix A. Detailed Fugitive Dust Calculation Workbook

Emission factors in grams per vehicle mile traveled for on-road vehicles were obtained from the EPA MOVES3 (Motor Vehicle Emission Simulator) model (EPA 2024e). Emissions from non-road construction equipment engines used during Project construction were estimated based on the anticipated types of non-road equipment and their associated levels of use. Emission factors in grams per horse power-hour were obtained using the most recent version of the EPA's NONROAD model (EPA 2023). Detailed construction emissions calculations along with the methodology and emissions factors used are provided in Appendix A.

2.2 Fugitive Dust Mitigation Measures

The following is a list of techniques and mitigation measures that will be utilized to reduce/control fugitive dust during Project construction and operations. It is important to note the required measures outlined in Routt County's municipal code are incorporated into the list and are italicized.

- Lessening the amount of surface being disturbed at any one time reduces the amount of control required and the amount of water or dust suppressant needed.
    - *Limit area of disturbance to reduce dust generation;*
    - *Minimize overlot grading for Projects and phase grading with construction;*
- *Minimize dust through gravel, water, or chemically stabilizing public and private access roads, stripped areas, transfer points and excavations. Gravel or chemical stabilization is preferred, and water stabilization shall be minimized to the extent possible;*
- *Increase mitigation operations immediately in response to periods of high wind conditions or dust complaints;*
    - High winds are hereby classified as anything greater than or equal to 40 miles per hour.
    - If soil-disturbing activities cannot be halted during high winds, apply water (or other dust suppressant) and/or other appropriate mitigation measures prior to anticipated high winds to reduce the potential for airborne dust.

- *Revegetate disturbed areas as soon as possible;*
- Haul truck loads will be covered, or a dust suppressant will be used to limit dust from becoming airborne during soil transport. Ensure load is 3–6 inches below the freeboard to minimize spillage. Check belly-dump truck seals regularly and remove any trapped rocks to prevent spillage.
- Trackouts onto paved surface will be cleaned at the end of each day. Gravel pads may be installed adjacent to paved roads to reduce trackouts.
- Ensure the construction schedule prioritizes the construction of parking lots, laydown areas, and paved roads whenever feasible.
- Ensure construction equipment is turned off when not in use.
- Restrict vehicle speeds to no more than 15 miles per hour on unpaved Project roadways to prevent excess dust being emitted into the air. Posted signs would indicate the speed limit at each Project site entrance. Traveling at reduced speeds on unpaved roads will limit the amount of dust suspended into the air. Personnel traveling on public roads will adhere to posted speed limits.
- Implement enhanced dust control measures (e.g., frequent watering, use of non-toxic suppressants, erosion control, and physical barriers) within 500 feet of mapped waterways to minimize fugitive dust emissions and protect water quality.

2.3 Fugitive Dust Monitoring

For monitoring, visual inspections will be performed by the environmental inspector (EI) periodically throughout the workday. If dust is visible, the most appropriate dust mitigation measure will be used. If the mitigation measure proves unsuccessful, then additional measures can be required at the discretion of the EI.

The EI will have authority to stop work to address persistent or serious fugitive dust issues. The EI will determine which mitigation/control measure is appropriate to correct the issue and, upon completion of the corrective action and successful dust abatement, approve contractors to resume construction activities.

Complaints of fugitive dust will be sent to the EI and investigated. The EI's observations of fugitive dust and corrective actions will be included in the EI's daily report. All reports and other records associated with fugitive dust control will be maintained by RWE.

The below fugitive dust contact table will be filled out prior to construction:

Table 5. Trapper Solar Project Fugitive Dust Contacts

Name and Contact Information	Phone Number(s)
Environmental Inspector(s) To be determined (TBD)	
Construction Contractor Superintendent TBD	
Lead Construction Specialist TBD	
Other RWE Construction Representatives TBD	

3 Conclusion

Construction activities such as land clearing, excavating, trenching, and grading are expected to generate fugitive dust. The amount of dust generated will be a function of construction activity, soil type, soil moisture content, wind speed, precipitation, vehicle traffic, vehicle types, and roadway characteristics. Emissions will be greater during dry periods and in areas of fine-textured soils subject to surface activity. This Dust Mitigation Plan provides techniques and mitigation measures that will be utilized to reduce/control fugitive dust during Project construction and operations, including measures required by Routt County.

4 LITERATURE CITED

Colorado Department of Public Health and Environment. 2024. Air permits for non-oil and gas. Available at: https://cdphe.colorado.gov/apens-and-air-permits/air-permits-for-non-oil-gas. Accessed April 21, 2024.

U.S. Environmental Protection Agency (EPA). 2024a. NAAQS Table. Available at: https://www.epa.gov/criteria-air-pollutants/naaqs-table. Accessed April 25, 2024.

_____. 2024b. Colorado Nonattainment/Maintenance Status for Each County by Year for all Criteria Pollutants. Available at: https://www3.epa.gov/airquality/greenbook/anayo_co.html. Accessed April 24, 2024.

_____. 2024c. General Conformity. Available at: https://www.epa.gov/general-conformity. Accessed April 24, 2024.

_____. 2024d. Outdoor Air Quality Data. Available at: https://www.epa.gov/outdoor-air-quality-data/monitor-values-report. Accessed April 25, 2024.

_____. 2024e. Latest Version of Motor Vehicle Emission Simulator (MOVES). Available at: https://19january2021snapshot.epa.gov/moves/latest-version-motor-vehicle-emission-simulator-moves_.html. Accessed April 26, 2024.

_____. 2023. NONROAD2008a Technical Reports. Available at: https://www.epa.gov/moves/nonroad-technical-reports#2008a. Accessed April 25, 2024.

_____. 2020. 2020 National Emissions Inventory (NEI) Data. Available at: https://www.epa.gov/air-emissions-inventories/2020-national-emissions-inventory-nei-data. Accessed April 23, 2024.

This page intentionally left blank.

APPENDIX A

Detailed Fugitive Dust Calculation Workbook

Trapper Solar Project
RWE Renewables Development, LLC
Fugitive Dust Emission Calculations

Total Construction Emissions Summary

Construction Emission Source	Emissions, tons	
	PM_{10}	$PM_{2.5}$
Off-Road Construction Equipment	1.38	1.27
On-Road Construction Equipment and Worker Commuting	0.05	0.02
Equipment/Material Delivery	20.66	2.36
Fugitive Dust From Construction Operations	75.82	7.58
Total:	**97.91**	**11.23**

Note: these are the total estimated construction emissions for the development of the Trapper Solar Project. Construction of the project will be completed over the course of 18 months.

Annual Construction Emissions Summary

Construction Emission Source	Emissions, tpy	
	PM_{10}	$PM_{2.5}$
Off-Road Construction Equipment	0.92	0.85
On-Road Construction Equipment and Worker Commuting	0.03	0.01
Equipment/Material Delivery	13.78	1.57
Fugitive Dust From Construction Operations	50.55	5.05
Total:	**65.27**	**7.49**

Annual Operational Emissions Summary

Operational Emission Source	Emissions, tpy	
	PM_{10}	$PM_{2.5}$
Off-Road Equipment	0.17	0.17
Inspection and Maintenance	0.03	0.00
On-Road Construction Equipment and Worker Commuting	2.81	0.32
Total:	**3.01**	**0.49**

Trapper Solar Project
RWE Renewables Development, LLC
Fugitive Dust Emission Calculations
On-Road Vehicle Emissions: Construction Worker Commuting and Equipment/Material Delivery

Project Construction On-Road Vehicle Miles

Construction Phase	Category	Vehicle Type	Quantity	Days Used	One-Way Trips per Day per Vehicle	Commuting/Material Delivery Miles Paved			Commuting/Material Delivery Miles Unpaved		
						Commuting Miles (One-Way Trip)	Total Miles per Day	Total Miles for Project	Commuting Miles (One-Way Trip)	Total Miles per Day	Total Miles for Project
Mobilization and Staging	Worker Commuting	Passenger Truck	15	10	2	24	720	7,200	3.5	105	1,050
Site Preparation	Worker Commuting	Passenger Truck	35	80	2	24	1,680	134,400	3.5	245	19,600
	Water Truck	Single Unit Short-haul Truck	4	80	2	6	48	3,840	3.5	28	2,240
Substation Construction	Worker Commuting	Passenger Truck	50	67	2	24	2,400	160,800	3.5	350	23,450
	Water Truck	Single Unit Short-haul Truck	1	67	2	6	12	804	3.5	7	469
Solar Array and BESS Construction	Worker Commuting	Passenger Truck	350	264	2	24	16,800	4,435,200	3.5	2,450	646,800
	Water Truck	Single Unit Short-haul Truck	4	260	2	6	48	12,480	3.5	28	7,280
	Concrete Truck	Single Unit Short-haul Truck	50	30	2	24	2,400	72,000	3.5	350	10,500
Gen-Tie Line Construction	Worker Commuting	Passenger Truck	35	85	2	24	1,680	142,800	3.5	245	20,825
	Concrete Truck	Single Unit Short-haul Truck	10	44	2	24	480	21,120	3.5	70	3,080
Commissioning & Testing	Worker Commuting	Passenger Truck	50	82	2	24	2,400	196,800	3.5	350	28,700
Demobilization	Worker Commuting	Passenger Truck	15	10	2	24	720	7,200	3.5	105	1,050
	Water Truck	Single Unit Short-haul Truck	2	10	2	6	24	240	3.5	14	140

MOVES3 On-Road Diesel Emission Factors (g/mile)

Vehicle Type	PM_{10}	$PM_{2.5}$
Combination Long-haul Truck	0.1717811	0.0916756
Single Unit Long-haul Truck	0.0867198	0.0377437
Single Unit Short-haul Truck	0.1012193	0.0440161
Light Commercial Truck	0.0820616	0.0534436

Source: Emission factors obtained from EPA's MOVES3 National Average Emission Factors for 2022. Emissions for passenger vehicles based on passenger truck gasoline emission factors, emissions for the HHDT and concrete trucks based on single unit short-haul truck diesel emission factors, and lowboy truck emissions based on light commercial truck diesel emission factors.

MOVES3 On-Road Gasoline Emission Factors (g/mile)

2022	PM_{10}	$PM_{2.5}$
Passenger Truck	0.0234828	0.0055308

Source: Emission factors obtained from EPA's MOVES3 National Average Emission Factors for 2022. Emissions for passenger vehicles based on passenger truck gasoline emission factors, emissions for the HHDT and concrete trucks based on single unit short-haul truck diesel emission factors, and lowboy truck emissions based on light commercial truck diesel emission factors.

Emission Factors for Fugitive Dust from Roads (lb/VMT)

Source	PM_{10}	$PM_{2.5}$
Unpaved Roads Emission Factors for Passenger Vehicles	0.17	0.02
Unpaved Roads Emission Factors for Delivery Trucks	0.35	0.03
Unpaved Roads Emission Factors for HHDT Vehicles	0.47	0.05
Unpaved Roads Emission Factors for Concrete Trucks	0.57	0.06
Paved Roads Emission Factors for Passenger Vehicles	1.01E-03	2.48E-04
Paved Roads Emission Factors for Delivery Vehicles	5.22E-03	1.28E-03
Paved Roads Emission Factors for HHDT Vehicles	0.01	2.60E-03
Paved Roads Emission Factors for Concrete Trucks	0.02	3.93E-03

Conversion Factors		
1 lb	453.59	g
1 ton	2,000.00	lb
1 metric ton	1.10	ton
1 gallon of diesel fuel	7	lb

Trapper Solar Project
RWE Renewables Development, LLC
Fugitive Dust Emission Calculations
On-Road Vehicle Emissions: Construction Worker Commuting and Equipment/Material Delivery

Project Construction On-Road Vehicle Emissions

Category	Vehicle Type		Total Miles	Emissions, lbs/hr	
				PM_{10}	$PM_{2.5}$
Mobilization and Staging	Worker Commuting	Passenger Truck	30	0.0016	0.0004
Site Preparation	Worker Commuting	Passenger Truck	70	0.0016	0.0004
	Water Truck	Single Unit Short-haul Truck	8	0.0067	0.0029
Substation Construction	Worker Commuting	Passenger Truck	100	0.0016	0.0004
	Water Truck	Single Unit Short-haul Truck	2	0.0067	0.0029
Solar Array and BESS Construction	Worker Commuting	Passenger Truck	600	0.0016	0.0004
	Water Truck	Single Unit Short-haul Truck	8	0.0067	0.0029
	Concrete Truck	Single Unit Short-haul Truck	100	0.0067	0.0029
Gen-Tie Construction	Worker Commuting	Passenger Truck	70	0.0016	0.0004
	Concrete Truck	Single Unit Short-haul Truck	20	0.0067	0.0029
Commissioning & Testing	Worker Commuting	Passenger Truck	100	0.0016	0.0004
Demobilization	Worker Commuting	Passenger Truck	30	0.0016	0.0004
	Water Truck	Single Unit Short-haul Truck	4	0.0067	0.0029
Total:				**0.05**	**0.02**

Assumed workers commuted in gasoline passenger trucks. All other vehicles are assumed to be diesel.
Example Calculations:

{ ([Unpaved Emission Factor, lb/mile] * [Total unpaved vehicle miles traveled for duration of project, miles/project]) + ([Paved Emission Factor, lb/mile] * [Paved vehicle miles traveled for duration of project, miles/project])} * [1 ton/2,000 lb] = Tons of pollutant for duration of project

[Emission Factor, g/mile] * [Total vehicle miles traveled for duration of project, miles/project] * [1 lb/453.59 g] * [1 ton/2,000 lb] = Tons of pollutant for duration of project

Trapper Solar Project
RWE Renewables Development, LLC
Fugitive Dust Emission Calculations
Construction Emissions: Off-Road Equipment

Conversion Factors		
1 lb	453.59	g
1 ton	2,000.00	lb
1 metric ton	1.10	ton
1 hp	0.7457	kw
1 lb/hp-hr	0.6083	kg/kw-hr
1 gallon of diesel fuel	7	lb

MOVES3 - Nonroad Diesel Construction Equipment Emission Factors (g/hr) [1]

Equipment	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	VOC	HAPS	CH_4	CO_2	N_2O
Off-Highway Trucks	77.9038	710.2117	0.6739	14.6014	14.1634	18.4608	9.9017	1.5851	247,913.4707	0.7230
Off-Highway Tractors	185.7147	750.5361	0.6578	26.3465	25.5562	30.0792	15.2331	2.0706	229,531.4727	0.9445
Dumpers/Tenders	24.7632	28.5770	0.0157	3.7861	3.6725	5.7798	2.6191	1.4805	4,739.6754	0.6753
Cranes	23.9981	97.4606	0.1500	4.2956	4.1667	5.3707	2.7196	2.5986	52,939.1612	1.1853
Graders	19.7764	57.0765	0.1769	4.0962	3.9733	3.4040	1.7124	0.2884	64,844.2046	0.1316
Forklifts	6.7558	60.1522	0.0842	1.0374	1.0063	1.2736	0.6614	7.3330	31,790.8865	3.3449
Crawler Tractor/Dozers	42.8583	142.1864	0.2303	7.1704	6.9553	6.4878	3.3341	0.5293	82,746.3448	0.2415
Excavators	17.1274	58.4878	0.1487	3.3545	3.2539	2.9137	1.4869	0.2581	54,725.4150	0.1178
Sweepers/Scrubbers	9.5267	42.7526	0.0629	1.7124	1.6611	1.7767	0.9506	65.8245	22,923.8410	30.0252
Trenchers	29.3408	96.1406	0.0739	4.1716	4.0464	4.7117	2.4354	2.1800	25,851.3888	0.9944
Aerial Lifts	32.7621	41.5492	0.0229	4.5882	4.4505	7.1770	3.2809	2.1940	7,115.4843	1.0008
Bore/Drill Rigs	63.1126	233.0096	0.1286	11.6213	11.2727	16.0284	7.3705	5.9718	40,746.3728	2.7240
Plate Compactors	7.1289	13.2006	0.0070	0.7424	0.7201	2.1786	1.2022	0.1890	1,904.1761	0.1641
Rollers	20.6238	63.3756	0.0848	3.4124	3.3100	3.1682	1.6903	0.3015	30,456.6287	2.6168
Other Construction Equipment	103.3086	240.9759	0.2953	15.0407	14.5895	15.3545	6.9220	0.6850	103,969.2708	8.9340
Light Commercial Truck	20.0716	17.6563	0.0271	1.2309	0.8017	2.4638	0.3936	0.1424	7,978.0195	0.0243
Single Unit Short-haul Truck	13.4388	20.3673	0.0451	1.5183	0.6602	1.1976	0.2052	0.1478	13,429.5680	0.0266

Sources:

[1] Emission factors obtained from EPA's MOVES3 national average emission factors for 2022.

[2] Pickup Truck assumes offroad operating speed of 15 mph.

Trapper Solar Project
RWE Renewables Development, LLC
Fugitive Dust Emission Calculations
Construction Emissions: Off-Road Equipment

Off-Road Mobile Source Emissions

Construction Phase	Equipment Type	MOVES3 Equipment Category	Quantity	Hours per Day	Days of Use	Total Cumulative Hours of Use	Emissions, tons	
							PM_{10}	$PM_{2.5}$
Mobilization and Staging	Forklifts	Forklifts	2	7	10	140	1.60E-04	1.55E-04
	Pickup Truck	Off-Highway Trucks	10	7	10	700	1.13E-02	1.09E-02
	Phase Total						**1.14E-02**	**1.11E-02**
Site Preparation	Graders	Graders	2	7	80	1,120	5.06E-03	4.91E-03
	Excavators	Excavators	2	7	80	1,120	4.14E-03	4.02E-03
	Backhoe	Crawler Tractor/Dozers	2	7	80	1,120	8.85E-03	8.59E-03
	Trenchers	Trenchers	2	7	80	1,120	5.15E-03	5.00E-03
	Water Truck	Single Unit Short-haul Truck	4	8	80	2,560	4.28E-03	1.86E-03
	Scraper	Graders	2	7	80	1,120	5.06E-03	4.91E-03
	Dump/Haul Truck	Dumpers/Tenders	4	7	80	2,240	9.35E-03	9.07E-03
	Dozers	Crawler Tractor/Dozers	4	7	80	2,240	1.77E-02	1.72E-02
	Roller	Rollers	2	7	80	1,120	4.21E-03	4.09E-03
	Pickup Truck	Light Commercial Truck	20	5	80	8,000	1.09E-02	7.07E-03
	Street Sweeper	Sweepers/Scrubbers	1	7	80	560	1.06E-03	1.03E-03
	Maintenance Vehicles	Light Commercial Truck	1	6	80	480	6.51E-04	4.24E-04
	Loader	Crawler Tractor/Dozers	2	7	80	1,120	8.85E-03	8.59E-03
	Phase Total						**8.52E-02**	**7.67E-02**
Substation Construction	Graders	Graders	1	7	10	70	3.16E-04	3.07E-04
	Scraper	Graders	2	7	10	140	6.32E-04	6.13E-04
	Excavators	Excavators	1	7	30	210	7.77E-04	7.53E-04
	Backhoe	Crawler Tractor/Dozers	1	7	30	210	1.66E-03	1.61E-03
	Plate Compactor	Plate Compactors	4	7	30	840	6.87E-04	6.67E-04
	Roller	Rollers	2	7	30	420	0.00	0.00
	Water Truck	Single Unit Short-haul Truck	1	8	67	536	8.97E-04	3.90E-04
	Manlifts	Cranes	2	2	30	120	5.68E-04	5.51E-04
	Concrete Trucks	Single Unit Short-haul Truck	50	7	30	10,500	1.76E-02	7.64E-03
	Dozers	Crawler Tractor/Dozers	2	7	10	140	1.11E-03	1.07E-03
	Phase Total						**2.58E-02**	**1.51E-02**
Solar Array and BESS Construction	Forklifts	Forklifts	10	7	260	18,200	0.02	0.02
	Tractor	Off-Highway Tractors	4	7	130	3,640	0.11	0.10
	Trenchers	Trenchers	2	7	130	1,820	0.01	0.01
	Concrete Trucks	Single Unit Short-haul Truck	11	7	10	770	0.00	0.00
	Backhoe	Crawler Tractor/Dozers	4	7	200	5,600	0.04	0.04
	Pile Drivers (PD10)	Bore/Drill Rigs	10	7	205	14,350	0.18	0.18
	Crane	Cranes	1	7	100	700	3.31E-03	3.22E-03
	Pickup Truck	Light Commercial Truck	40	5	260	52,000	7.06E-02	4.60E-02
	ATV	Light Commercial Truck	30	7	260	54,600	0.07	0.05
	Street Sweeper	Sweepers/Scrubbers	2	4	260	2,080	3.93E-03	3.81E-03
	Maintenance Truck	Light Commercial Truck	4	7	260	7,280	0.01	0.01
	Excavators	Excavators	2	7	130	1,820	0.01	0.01
	Water Truck	Single Unit Short-haul Truck	4	8	260	8,320	0.01	0.01
	Drill rigs	Bore/Drill Rigs	1	7	205	1,435	0.02	0.02
	Phase Total						**5.65E-01**	**4.91E-01**
	Concrete Trucks	Dumpers/Tenders	58	7	44	17,864	7.46E-02	7.23E-02

Trapper Solar Project
RWE Renewables Development, LLC
Fugitive Dust Emission Calculations
Construction Emissions: Off-Road Equipment

Gen-Tie Line Construction	Crane Truck	Cranes	3	7	44	924	4.38E-03	4.24E-03
	Reel-Stringing Trailer	Generators - 24 hp	3	7	45	945	7.46E-03	7.46E-03
	Tensioning Machine	Generators - 24 hp	3	7	45	945	7.46E-03	7.46E-03
	Pullers	Light Commercial Truck	3	7	45	945	1.28E-03	8.35E-04
	Utility Truck	Light Commercial Truck	5	7	44	1,540	2.09E-03	1.36E-03
	ATV	Light Commercial Truck	6	7	84	3,528	0.00	0.00
	Pickup Truck	Light Commercial Truck	6	5	84	2,520	3.42E-03	2.23E-03
	Backhoe	Crawler Tractor/Dozers	1	7	44	308	2.43E-03	2.36E-03
	Drill rigs	Bore/Drill Rigs	1	7	44	308	3.95E-03	3.83E-03
	Phase Total						**3.72E-02**	**3.29E-02**
Commissioning & Testing	Pickup Truck	Light Commercial Truck	6	12	82	5,904	8.01E-03	5.22E-03
	ATV	Light Commercial Truck	6	17	82	8,364	0.01	0.01
	Generators	Generators - 24 hp	2	24	82	3,936	0.03	0.03
	Phase Total						**4.24E-02**	**3.85E-02**
Demobilization	Graders	Graders	1	7	10	70	3.16E-04	3.07E-04
	Loader	Crawler Tractor/Dozers	2	7	10	140	1.11E-03	1.07E-03
	Dump Truck	Dumpers/Tenders	4	7	10	280	1.17E-03	1.13E-03
	Water Truck	Single Unit Short-haul Truck	2	8	10	160	2.68E-04	1.16E-04
	Forklifts	Forklifts	4	7	10	280	3.20E-04	3.11E-04
	Scraper	Graders	2	7	10	140	6.32E-04	6.13E-04
	Excavators	Excavators	4	7	10	280	1.04E-03	1.00E-03
	Phase Total						**4.85E-03**	**4.56E-03**
Other	Generators	Generators - 24 hp	10	8	292	23,360	0.18	0.18
	Generators	Generators - 24 hp	2	24	365	17,520	0.14	0.14
	Generators	Generators - 12.2 hp	24	10	292	70,080	0.28	0.28
	Phase Total						**6.04E-01**	**6.04E-01**
						Total:	**1.38**	**1.27**

Note: The equipment type is 'mapped' to the appropriate MOVES3 equipment category in order to determine the emission factor for estimating emissions.
Per the POD, construction will occur 5 days per week, but RFI response mentioned 6 days per week. Assumed 6 days per week to be conservative.

Example Calculation: [Emission Factor, g/hour] * [Equipment hours used per day, hours/day] * [Days Used, days/project] * [1 lb / 453.59 g] * [1 ton / 2000 lb] = Tons of pollutant for duration of project

Trapper Solar Project
RWE Renewables Development, LLC
Fugitive Dust Emission Calculations
Construction Emissions: Equipment Delivery

Emission Factors for Heavy-Heavy Duty Trucks in Pounds per Mile

Vehicle Type	Units	Emission Factor		Fugitive Dust from Unpaved Roads [2]		Fugitive Dust from Paved Roads [2]	
		PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Delivery Trucks[1]	lb/mile	0.00019	0.00008	0.35	0.03	0.01	0.00

[1] Emission factors obtained from EPA's MOVES3 National Average Emission Factors for 2022. Emission factors for delivery truck use emission factors for a diesel single unit long-haul truck.

[2] Based on fugitive dust emission factors calculated for delivery trucks. Weight of delivery truck approximated to be 10 tons for fugitive dust emission factors.

Heavy Duty Truck Material Delivery Assumptions

Parameter	Value	Source / Notes
Total Truck Trips	15,450	*Delivery Trips per Day x Project Duration in Days*
On-Road Material Delivery Miles, Round-Trip, per Load	48	*Anticipated delivery distance from Las Vegas, NV is 24 miles one-way.*
Total On-Road Material Delivery Miles Traveled	695,250	*Total Truck Trips x On-Road Material Delivery Miles, Round-Trip, per Load*
Off-Road Material Delivery Miles, Round-Trip, per Load	7	*Estimated 3.5 miles*
Total Off-Road Material Delivery Miles Traveled	108,150	*Total Truck Trips x Off-Road Material Delivery Miles, Round-Trip, per Load*
Total On- and Off-Road Material Delivery Miles Traveled	803,400	*Total On-Road Material Delivery Miles Traveled + Total Off-Road Material Delivery Miles Traveled*

Annual Emissions From Material Delivery Using Heavy-Heavy Duty Trucks

Vehicle Type	Emissions, tpy	
	PM_{10}	$PM_{2.5}$
On-Road Delivery Trucks	0.08	0.03
Fugitive Dust From Paved Roads	1.81	0.45
Fugitive Dust From Unpaved Roads	18.77	1.88
Total Emissions from Material Delivery	**20.66**	**2.36**

Example Calculation (for HHDT): [Emission Factor, lb/mile] * [Total vehicle miles traveled for all loads, miles/project] * [1 ton / 2000 lb] = Tons of pollutant for duration of project

Trapper Solar Project
RWE Renewables Development, LLC
Fugitive Dust Emission Calculations
Construction Emissions: Earthmoving Activities

Fugitive Dust from Construction Operations: General Construction

Parameter	Value	Source / Notes
Total Acres Affected During Construction	758	*Total project area is 3030 acres--an estimate of 25% of total area was used to determine this value.*
Total Months of Construction for Phase	18	*From Trapper Solar Permitting Schedule spreadsheet*
General Construction PM_{10} Emission Factor, ton/acre-month	0.011	*WRAP Fugitive Dust Handbook, Table 3-2, "Level 2"*
Total Cubic Yard On-Site Cut/Fill (in 1,000 cubic yards)	293.76	*Rough estimate based on Yellow Pine Solar Project EIS.*
On-Site Cut-Fill PM_{10} Emission Factor, ton/1,000 cubic yards	0.059	*WRAP Fugitive Dust Handbook, Table 3-2, "Level 2"*
Project Duration in Days	546	*18 months = 78 weeks= 546 days*
Assumed Control Efficiency, %	61%	*WRAP Fugitive Dust Handbook, Table 3-6, for applying water at various intervals (3.2-hr watering interval)*

Source: Based on WRAP Fugitive Dust Handbook, Table 3-2, "Recommended PM_{10} Emission Factors for Construction Operations," Level 2. http://www.wrapair.org/forums/dejf/fdh/content/final-handbook.pdf

Fugitive Dust Emissions from Construction (tons)

Source	PM_{10}	$PM_{2.5}$
General Construction	58.49	5.85
On-Site Cut/Fill	17.33	1.73
Total Fugitive Dust Emissions, tons	**75.82**	**7.58**

Note: $PM_{2.5}/PM_{10}$ ratio of 0.10 used from the WRAP Fugitive Dust Handbook, Section 3.3.1.

Example Calculation, General Construction: [Emission Factor, ton/acre-month] * [# of acres affected] * [# of months of construction/project] * [1 - Control Efficiency] = Tons of pollutant for duration of project

Trapper Solar Project
RWE Renewables Development, LLC
Fugitive Dust Emission Calculations
Operational Emissions: Off-Road Equipment

Conversion Factors		
1 lb	453.59	g
1 ton	2,000.00	lb
1 metric ton	1.10	ton
1 hp	0.7457	kw
1 lb/hp-hr	0.6083	kg/kw-hr
1 gallon of diesel fuel	7	lb

MOVES3 - Nonroad Diesel Construction Equipment Emission Factors (g/hr) [1]

Equipment	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	VOC	HAPS	CH_4	CO_2	N_2O
Off-Highway Trucks	77.9038	710.2117	0.6739	14.6014	14.1634	18.4608	9.9017	1.5851	247,913.4707	0.7230
Off-Highway Tractors	185.7147	750.5361	0.6578	26.3465	25.5562	30.0792	15.2331	2.0706	229,531.4727	0.9445
Dumpers/Tenders	24.7632	28.5770	0.0157	3.7861	3.6725	5.7798	2.6191	1.4805	4,739.6754	0.6753
Cranes	23.9981	97.4606	0.1500	4.2956	4.1667	5.3707	2.7196	2.5986	52,939.1612	1.1853
Graders	19.7764	57.0765	0.1769	4.0962	3.9733	3.4040	1.7124	0.2884	64,844.2046	0.1316
Forklifts	6.7558	60.1522	0.0842	1.0374	1.0063	1.2736	0.6614	7.3330	31,790.8865	3.3449
Crawler Tractor/Dozers	42.8583	142.1864	0.2303	7.1704	6.9553	6.4878	3.3341	0.5293	82,746.3448	0.2415
Excavators	17.1274	58.4878	0.1487	3.3545	3.2539	2.9137	1.4869	0.2581	54,725.4150	0.1178
Sweepers/Scrubbers	9.5267	42.7526	0.0629	1.7124	1.6611	1.7767	0.9506	65.8245	22,923.8410	30.0252
Trenchers	29.3408	96.1406	0.0739	4.1716	4.0464	4.7117	2.4354	2.1800	25,851.3888	0.9944
Aerial Lifts	32.7621	41.5492	0.0229	4.5882	4.4505	7.1770	3.2809	2.1940	7,115.4843	1.0008
Bore/Drill Rigs	63.1126	233.0096	0.1286	11.6213	11.2727	16.0284	7.3705	5.9718	40,746.3728	2.7240

Sources:

[1] Emission factors obtained from EPA's MOVES3 national average emission factors for 2022.

Stationary Operation Equipment Emissions

Equipment	Kilowatts (kw)	Emission Factors (g/hr)									
		CO [1]	NO_X [1]	SO_X [2]	PM_{10} [1]	$PM_{2.5}$ [1]	VOC [1]	HAPS [3]	CH_4 [4]	CO_2	N_2O [4]
Generators	17.89679692	118.1189	124.1569	22.3166	7.1587	7.1587	10.0691	0.2888	0.5040	12,519.0818	0.1008

1: Emission factors for diesel engines per EPA Tier 4 Exhaust Emission Standards for Nonroad CI Engines for 8 ≤ kW < 19. Assumed $PM_{2.5} = PM_{10} = PM$. .

2: Emission factors for diesel engines per AP-42 Chapter 3 Section 3 – *Gasoline and Diesel Industrial Engines* , Table 3.3-1. Converted EFs from lb/hp-hr to g/hr per the following equation:

lb/hp-hr EF x 1 hp/0.7457 kw x generator kw x 453.59 g/lb

Off-Road Mobile Source Emissions - Annual

Activity	Equipment Type	MOVES3 Equipment Category	Quantity	Hours per Day	Days of Use per Year	Total Cumulative Hours of Use	Emissions, tpy	
							PM_{10}	$PM_{2.5}$
Operations & Maintenance	3/4-ton Pickup	Off-Highway Trucks	2	8	210	3,360	0.05	0.05
	Utility Vehicle	Off-Highway Trucks	1	8	210	1,680	0.03	0.03
	Flatbed Truck	Off-Highway Tractors	1	8	210	1,680	0.05	0.05
	Dump Truck	Dumpers/Tenders	1	8	210	1,680	0.01	0.01
	Front-End	Crawler Tractor/Dozers	1	8	210	1,680	0.01	0.01
	Mower	Graders	1	8	210	1,680	0.01	0.01
	Trimmer	Crawler Tractor/Dozers	1	8	210	1,680	0.01	0.01
						Total:	**0.17**	**0.17**

Note: The equipment type is 'mapped' to the appropriate MOVES3 equipment category in order to determine the emission factor for estimating emissions.

Example Calculation: [Emission Factor, g/hour] * [Equipment hours used per day, hours/day] * [Days Used, days/project] * [1 lb / 453.59 g] * [1 ton / 2000 lb] = Tons of pollutant for duration of project

Trapper Solar Project
RWE Renewables Development, LLC
Fugitive Dust Emission Calculations
Operational Emissions: Worker Commuting and Equipment/Material Delivery

Project Operation On-Road Vehicle Miles

Activity	Category	Vehicle Type	Quantity	Days Used	One-Way Trips per Day per Vehicle	Commuting/Material Delivery Miles Paved			Commuting/Material Delivery Miles Unpaved		
						Commuting Miles (One-Way Trip)	Total Miles per Day	Total Miles for Project	Commuting Miles (One-Way Trip)	Total Miles per Day	Total Miles for Project
Inspectors	Worker Commuting	Passenger Truck	10	210	2	24	480	100,800	3.5	70	14,700
Operation & Maintenance	Water Truck	Single Unit Short-haul Truck	3	210	2	24	144	30,240	3.5	21	4,410
	Utility Truck	Light Commercial Truck	1	210	2	51	102	21,420	3.5	7	1,470

Notes: Workers were assumed to commute from Twin Falls, ID, 1-2 people per vehicle. Heavy haul vehicles were assumed to travel from the nearest rail station in Minidoka, ID. Construction vehicles were assumed to commute from Twin Falls, ID. Paved and unpaved distances were estimated via GIS.

MOVES3 On-Road Diesel Emission Factors (g/mile)

Vehicle Type	CO	NO_X	VOC	HAPS	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
Combination Long-haul Truck	1.9095245	3.9145019	0.1321223	0.0242338	0.0054192	0.1717811	0.0916756	1,613.9419421	0.0165605	0.0016702
Single Unit Long-haul Truck	0.8283386	1.1881854	0.0696398	0.0118106	0.0028200	0.0867198	0.0377437	841.1051086	0.0082712	0.0016920
Single Unit Short-haul Truck	0.8959167	1.3578205	0.0798372	0.0136797	0.0030052	0.1012193	0.0440161	895.3045324	0.0098539	0.0017731
Light Commercial Truck	1.3381067	1.1770871	0.1642511	0.0262402	0.0018061	0.0820616	0.0534436	531.8679668	0.0094940	0.0016196

Source: Emission factors obtained from EPA's MOVES3 National Average Emission Factors for 2022. Emissions for passenger vehicles based on passenger truck gasoline emission factors, emissions for the HHDT and concrete trucks based on single unit short-haul truck diesel emission factors, and lowboy truck emissions based on light commercial truck diesel emission factors.

MOVES3 On-Road Gasoline Emission Factors (g/mile)

2022	CO	NO_X	VOC	HAPS	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
Passenger Truck	3.2178695	0.2347212	0.0414528	0.0114498	0.0022158	0.0234828	0.0055308	363.9713605	0.0108378	0.0018428

Source: Emission factors obtained from EPA's MOVES3 National Average Emission Factors for 2022. Emissions for passenger vehicles based on passenger truck gasoline emission factors, emissions for the HHDT and concrete trucks based on single unit short-haul truck diesel emission factors, and lowboy truck emissions based on light commercial truck diesel emission factors.

Emission Factors for Fugitive Dust from Roads (lb/VMT)

Source	PM_{10}	$PM_{2.5}$
Unpaved Roads Emission Factors for Passenger Vehicles	0.17	0.02
Unpaved Roads Emission Factors for Delivery Trucks	0.35	0.03
Unpaved Roads Emission Factors for HHDT Vehicles	0.47	0.05
Unpaved Roads Emission Factors for Concrete Trucks	0.57	0.06
Paved Roads Emission Factors for Passenger Vehicles	1.01E-03	2.48E-04
Paved Roads Emission Factors for Delivery Vehicles	5.22E-03	1.28E-03
Paved Roads Emission Factors for HHDT Vehicles	0.01	2.60E-03
Paved Roads Emission Factors for Concrete Trucks	0.02	3.93E-03

Conversion Factors		
1 lb	453.59	g
1 ton	2,000.00	lb
1 metric ton	1.10	ton
1 gallon of diesel fuel	7	lb

Trapper Solar Project
RWE Renewables Development, LLC
Fugitive Dust Emission Calculations
Operational Emissions: Worker Commuting and Equipment/Material Delivery

Project Operations On-Road Vehicle Emissions - Annual

Category	Vehicle Type	Total Miles	Emissions, tpy	
			PM_{10}	$PM_{2.5}$
Construction Worker Commute	Passenger Truck	115,500	0.00	0.00
Fugitive Dust From Paved Roads	Passenger Truck	100,800	0.05	0.01
Fugitive Dust From Unpaved Roads	Passenger Truck	14,700	1.24	0.12
Construction Vehicles	Single Unit Short-haul Truck	34,650	0.00	0.00
Fugitive Dust From Paved Roads	HHDT Vehicle	30,240	0.16	0.04
Fugitive Dust From Unpaved Roads	HHDT Vehicle	4,410	1.05	0.10
Construction & Delivery Vehicles	Light Commercial Truck	22,890	0.00	0.00
Fugitive Dust From Paved Roads	Delivery Vehicle	21,420	0.06	0.01
Fugitive Dust From Unpaved Roads	Delivery Vehicle	1,470	0.26	0.03
Heavy-Heavy Duty Vehicles	Combination Long-haul Truck	0	0.00	0.00
Fugitive Dust From Paved Roads	HHDT Vehicle	0	0.00	0.00
Fugitive Dust From Unpaved Roads	HHDT Vehicle	0	0.00	0.00
		Total:	**2.81**	**0.32**

Assumed workers commuted in gasoline passenger trucks. All other vehicles are assumed to be diesel.
Example Calculations:

{ ([Unpaved Emission Factor, lb/mile] * [Total unpaved vehicle miles traveled for duration of project, miles/project]) + ([Paved Emission Factor, lb/mile] * [Paved vehicle miles traveled for duration of project, miles/project])} * [1 ton/2,000 lb] = Tons of pollutant for duration of project

[Emission Factor, g/mile] * [Total vehicle miles traveled for duration of project, miles/project] * [1 lb/453.59 g] * [1 ton/2,000 lb] = Tons of pollutant for duration of project

Trapper Solar Project
RWE Renewables Development, LLC
Fugitive Dust Emission Calculations
Operational Emissions: Inspection and Maintenance Emissions

Emission Factors for On-Road Passenger Vehicles, in Pounds per Mile

Vehicle Type	On-Road SCAQMD Emission Factors								Fugitive Dust from Unpaved Roads		Fugitive Dust from Paved Roads	
	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	VOC	CH_4	CO_2	PM_{10} [1]	$PM_{2.5}$ [1]	PM_{10} [1]	$PM_{2.5}$ [1]
Passenger Vehicles	0.00397866	0.00035150	0.00001072	0.00009661	0.00006389	0.00048658	0.00004121	1.11019931	0.17	0.02	0.00	0.00

Note: SCAQMD EMFAC 2007 (v2.3) Emission Factors can be found at: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/emfac-2007-(v2-3)-emission-factors-(on-road). SCAQMD EMFAC 2007 (v2.3) Emission Factors for scenario year 2022 (all vehicle model years in the range from 1978 to 2022) was used).

[1] Fugitive dust from paved and unpaved road emission factors estimated using AP-42 Section 13.2.1 & Section 13.2.2. Mean vehicle weight was conservatively estimated at 2 tons for passenger vehicles.

Inspection and Maintenance Activity Assumptions

Parameter	Value	Source / Notes
Number of Site Visits per Year	52	*Estimated*
Total On-Road Miles, Round-Trip	63	*Anticipated delivery distance from Dillon, MT is 35 miles one-way, 3.5 miles of which are unpaved.*
Total On-Road Miles, Round-Trip, Per Year	3,276	*Number of Site Visits per Year x Total On-Road Miles, Round-Trip*
Off-Road Distance Traveled Round-Trip	7	*Estimated*
Total Off-Road Miles Traveled per Year	364	*Off-Road Distance Traveled Round-Trip x Number of Site Visits per Year = Total Off-Road Miles Traveled per Year*
Total On- and Off-Road Vehicle Miles Traveled per Round-Trip	70	*Total On-Road Miles, Round-Trip + Off-Road Distance Traveled Round-Trip*
Total On- and Off-Road Vehicle Miles Traveled per Year	3,640	*Total On-Road Miles, Round-Trip, Per Year + Total Off-Road Miles Traveled per Year*

Annual Emissions From Inspection and Maintenance Activities using On-Road Passenger Vehicles, in Tons per Year

Vehicle Type	Emissions, tpy	
	PM_{10}	$PM_{2.5}$
On-Road Passenger Vehicles	0.00	0.00
Fugitive Dust from Paved Roads	0.00	0.00
Fugitive Dust from Unpaved Roads	0.03	0.00
Total Inspection and Maintenance Activity Emissions	**0.03**	**0.00**

Example Calculation: [Emission Factor, lb/mile] * [Total vehicle miles traveled per year, miles/year] * [1 ton / 2,000 lb] = Tons of pollutant per year